

New Jersey Geological and Water Survey Geoscientific Data Preservation Project

National Geological and Geophysical Data Preservation Program

**Award Number: G15AP00135
FINAL TECHNICAL REPORT FOR FISCAL YEAR 2015
September 15, 2015 to September 14, 2016**

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Abstract:

In fiscal year 2015, the New Jersey Geological and Water Survey (NJGWS) was awarded \$34,330 by the U.S. Geological Survey (USGS) under the National Geological and Geophysical Data Preservation Program (NGGDPP). This marked the sixth award presented to the Survey since 2007, with total funds of \$135,514 received under this program. In each grant year, the NJGWS has matched the USGS award on a one to one basis.

Using grant money awarded for fiscal year 2015, the NJGWS focused its preservation work on scanning the following items in its collection of geologic information: (1) six mineral commodities field notebooks, (2) the two-volume Index to Geological Survey Reports, (3) geological maps, field notes, and field station data from recently retired (06/30/14), geologist Rich Volkert as part of the Geologic Legacy Program, (4) mine site visit inspection reports ("Crib Sheets"), (5) paper geologic mine logs (final group of 3), and (6) nine geologic field notebooks from retired, (1950's), former state geologist Meredith Johnson. Work also included (7) the Oxford rock core preservation and data collection project which included logging and photographing one rock core from Upper Denmark Road in Oxford NJ and six residential well logs associated with the Oxford rock core project which were from well logs of domestic wells in the same neighborhood. Associated metadata for all seven projects was created and uploaded to the NDC.

Prior to fiscal year 2015, the NJGWS used grant funds received to identify 21 collections to target for preservation and preserved 94 rock cores (#P1294), 209 sediment cores (#P1651), 924 geochemical samples (#P1295), 638 paper maps (#P1099), 139 digital maps (#P1303), 285 digital well logs (#P1306), 230 paper well logs (#P1307), 7,581 paper lithology logs (#P1297), 6,395 paper field notes (#P1293), and seven photographs (#P1300). All associated metadata has been uploaded to the NDC.

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FINAL TECHNICAL REPORT

FY2015

New Jersey Geological and Water Survey Geoscientific Data Preservation Project

Background

In total, since 2007, the New Jersey Geological and Water Survey (NJGWS) has been awarded \$135,514 by the U.S. Geological Survey (USGS) under the National Geological and Geophysical Data Preservation Program (NGGDPP) for the purposes of identifying, cataloging, securing and preserving at-risk data. The State of New Jersey has matched these funds 1:1.

In fiscal year 2007, under the Data Preservation Grant, the NJGWS conducted a survey of its geological and geophysical data collections and added 18 collections to the NDC. Three more collections were identified and added in fiscal year 2009. Since these collections were identified, the NJGWS has used its grant funding to preserve the most at-risk data in the inventory. This work includes preservation of 95 rock cores (#P1294), 209 sediment cores (#P1651), 924 geochemical samples (#P1295), 685 paper maps (#P1099), 139 digital maps (#P1303), 285 digital well logs (#P1306), 230 paper well logs (#P1307), 7,587 paper lithology logs (#P1297), 17,297 paper field notes (#P1293), 544 paper reports (#P1292) and 35 photographs (#P1300). Associated metadata for all preserved items has been uploaded to the NDC. The items in the collections listed in the inventory have been made accessible to outside entities, including government agencies and the private-sector and are mainly used for research, education, land management, hazard mitigation and engineering studies.

In fiscal year 2015, the NJGWS applied for, and obtained, a one-year grant award of \$34,330 from the NGGDPP. The State of New Jersey matched this grant 1:1.

Goals and Objectives of the Fiscal Year 2015 Grant

The objectives of the fiscal year 2015 grant were to (1) scan three mineral commodities field notebooks, (2) scan the two-volume Index to NJ Geological Survey Reports, (3) scan documents as part of the Geologic Legacy Program including 25 geological maps

and associated field notes and digitize field station data from recently retired geologist Rich Volkert, (4) scan 800 mine site visit inspection reports ("Crib Sheets") (5) scan and update database for 515 geologic mine logs (group 3 of 3), (6) scan four geologic field notebooks from long ago retired former state geologist Meredith Johnson and (7) preserve 500 feet of continuous rock core drilled in on Upper Denmark Road in Oxford, NJ, including logging and photographing the Oxford core and scanning four residential well logs associated with the Oxford core project. Metadata was to be created for all items preserved and uploaded into the NDC. NJGWS successfully met all the goals and deadlines of the grant.

Fiscal Year 2015 Accomplishments

Mineral Commodities Books (#P1292) Under the fiscal year 2015 grant, the NJGWS scanned the six Mineral Commodities Books in its possession. They date from the late 1800's to about 1915 and include all mining activities and statistics reported to the NJ Geological Survey during those years. The NJGS was the repository for this information pre-1915 prior to the US Bureau of Mines taking over. There are three books with New Jersey mining information from all mines, sand pits and clay pits active in the state before 1915. Preservation efforts will benefit anyone with an interest in obtaining pre-1915 mineral statistics for New Jersey.

The books in this collection were converted from paper to digital media using an HP Scanjet 8200 scanner. The documents were scanned at 300 dpi and saved as .tiff files. Metadata for each of the six books was then compiled in Microsoft Excel®, saved as a comma delimited file, and uploaded to the NDC.

Index to NJ Geological Survey Reports (#P1292) The NJGWS scanned the two-volume Index to NJ Geological Survey Reports. They are an alphabetical listing of all topics in NJGS reports from 1835 to the late 1950's included in NJGS Annual Reports and Bulletins. Volume one covers topics beginning with the letters A - K and Volume two covers topics beginning with the letters L - Z. This is the only version of an index for NJ Geological Survey reports.

The two index books were scanned at 300 dpi using a HP Scanjet 8200 scanner and were saved as .tiff files. Metadata was created in Microsoft Excel®, saved as a comma delimited file and uploaded into the NDC.

Geologic Legacy Program (#P1293) and (#P1099) As part of its Geologic Legacy Program, the NJGWS scanned and digitized documents from recently retired geologist Richard Volkert who retired on 6/30/2014. The documents scanned included 46 bedrock geology field notebooks, 47 scanned topographic field maps associated with the field notebooks, and the digitizing of approximately 17,297 field locations from the field maps and notebooks. The 47 topographic field maps were scanned using a using a Colortrac SmartLF Gx+ T42 scanner and saved as .tiff images. The 46 field notebooks were scanned on a Ricoh Aficio MP 6001 copier/scanner and saved as individual .pdf files. Field stations were digitized using NASA World Wind software. The

17,297 digitized station point locations were saved and imported into an ESRI ArcGIS geodatabase using ArcGIS Geographic Information System software. Metadata for the field notes, field maps and field locations was then created in Microsoft Excel®, saved as comma delimited files and uploaded to the NDC.

Mine Crib Sheets (#P1292) The NJGWS scanned 536 mine site inspection reports (“Crib Sheets”) in its collection. There were two collections of crib sheets collected for mines and quarries inventoried during the late 1970’s and early 1980’s. The data was collected after receiving a federal grant to document the information. These sheets contain information on all mines and quarries in the state. The sheets contain specific information on each mine/quarry, including property owners of the mine at the time, production information, location of the mine/quarry (sometimes including lot and block) and geologic information. Metadata was then created in Microsoft Excel®, saved as a comma delimited file and uploaded to the NDC.

Geologic Mine Logs (batch 3 of 3) (#P1293) The NJGWS scanned and digitized 517 penciled, historic geologic mine logs from New Jersey’s mines, pits and quarries. The data contained on the paper index cards dates back to the 1980’s. This was the third and final of three batches in this collection to be preserved. In 2012 and 2014, using NGGDPP funding, the first 1,000 logs were scanned. In addition to scanning the index cards, the information contained on the cards was added to the existing database of mine logs created under the 2012 data preservation grant.

The mine logs were converted from paper index cards into a more secure digital format. Each mine log was scanned at 300 dpi using a Ricoh Aficio MP 6001 copier/scanner and saved as individual .pdf files. Under the 2012 grant, a database was created in Microsoft Access® in which the information contained on each geologic mine card was entered. The data contained on this third batch of 517 logs was entered into this database. As with the previous batch of logs, each of these 517 logs was assigned a unique number for ease of identification and access in order to efficiently respond to future research needs. Metadata was then created in Microsoft Excel®, saved as a comma delimited file and uploaded to the NDC.

Meredith Johnson Field Notes (#P1293) The NJGWS continued the work it started under the 2012 NGGDPP grant by preserving an additional four geologic field notebooks. This collection is comprised of handwritten historic observation notes made by staff geologists while working in the field. The NJGWS scanned the former NJ State Geologist’s field notes compiled during his career at the NJGWS. They are currently stored in the NJGWS library. The notes were taken from 1924 through 1958. They are a one-of-a-kind collection and contain detailed information from his field work. This preservation effort benefits users at the NJGWS, NJDEP employees and the general public. The collection contains nine books of field notes. Four books were originally scheduled to be scanned. Additional work was done to scan the remaining five books in the collection making for a total of nine books scanned in the Meredith Johnson field notes collection. The books were scanned at 300 dpi using a HP Scanjet 8200 scanner and were saved as .tiff files. Metadata was then created in Microsoft Excel®, saved as a comma delimited file and uploaded to the NDC.

Oxford Rock Core Preservation (#P1294) Residential Well Logs (#P1297) and Rock Core Segment Photographs (#P1300) The NJGWS cataloged, cross referenced and preserved 500 feet of continuous rock core drilled on Upper Denmark Road in Oxford Township, NJ in 2011. This Rock core was drilled as part of a site remediation investigation of arsenic contaminated wells. This core is significant because it demonstrates that the arsenic in the area is naturally occurring and the data from the core will be useful in other site remediation investigations. The core, which is held in temporary storage at the Survey's facilities (garage and carport), will be moved to a permanent, more secure storage site in the future. The cores were catalogued and photographed over their entire length and detailed lithologic, structural and mineralogical descriptions recorded. The core segments are stored in 25 boxes, each containing 20 feet of core. Photographs of the 28 core segments were also taken and preserved digitally.

In addition, four downhole geophysical logs of adjacent residential wells taken during coring were also scanned and preserved digitally and combined with the core data in a digital database. The logs include caliper, UDR well diagram, gamma log, spontaneous potential, single point resistance, fluid temperature, fluid conductivity, borehole flow diagram, heat-pulse flow meter, borehole flow diagram and optical televiewer measurements. Additionally, two more geophysical well logs of adjacent residential well logs from Oxford were scanned making for a total of six residential well logs. Metadata was then created in Microsoft Excel[®], saved as comma delimited files and uploaded to the NDC.

Benefits

Since 2007, the NJGWS has preserved thousands of pieces of data housed on paper that was in jeopardy of being lost to deterioration. Much of this valuable data can no longer be acquired or replicated without substantial cost due to significant commercial and residential development across the state. The work done under the NGGDPP grant helps to fulfill New Jersey's data preservation goal to provide some of its raw field data online, making it accessible to interested parties. As a result of funding from the NGGDPP, much of this data has been converted to digital format and is used on a daily basis by staff geologists. In addition, the data collections and the supporting geological and geophysical records are primary resources used by external entities, including geologists, engineering and environmental firms, non-governmental organizations, educational institutions and government agencies working on water supply, pollution remediation, environmental compliance, natural-resource inventory, mine safety hazard mitigation and construction and research projects.

One way in which the Survey measures the use of its data by external users is through web statistics and orders received for print publications. (See Attachment 1 for a detailed metrics table). Below are some examples of the way in which our data, preserved under NGGDPP funding, has been used successfully by external agents.

- Digitized filed notes and field maps from the geologic legacy program and mine crib sheets were used by interested parties to determine if any geologic hazards existed along the planned route of the proposed Penn East gas pipeline construction project.

- Geological consultants continued to frequently make use of NJGWS data, and in particular, it's digitized historical documents. Field notebooks, permanent notes and scanned maps are often used for site remediation projects. Additionally, our digital data has been used to prepare several presentations and publications. In addition, access to our digital data has been helpful in several environmental legal cases.

Summary

The NJGWS used its fiscal year 2015 grant money to satisfy its goals under Grant Objective 3. Specifically, a digital infrastructure was created for six Mineral Commodities_Books (#P1292), in its possession. The NJGWS scanned the two-volume Index to NJ Geological Survey Reports (#P1292). As part of the Geologic Legacy Program (#P1293) and (#P1099), the NJGWS scanned and digitized documents from recently retired geologist Richard Volkert who retired on 6/30/2014. The documents scanned included 46 bedrock geology field notebooks, 47 scanned topographic field maps associated with the field notebooks, and the digitizing of approximately 17,297 field locations from the field maps and notebooks. The NJGWS scanned 536 mine site inspection reports Mine Crib Sheets_in its collection (#P1292). Geologic Mine Logs (batch 3 of 3) were scanned (#P1293). The NJGWS scanned and digitized 517 penciled, historic geologic mine logs from New Jersey's mines, pits and quarries. Meredith Johnson Field Notes (#P1293). Here the NJGWS continued the work it started under the 2012 NGGDPP grant by preserving an additional nine geologic field notebooks. Oxford Rock Core Preservation (#P1294). The NJGWS cataloged, cross referenced and preserved 500 feet of continuous rock core drilled on Upper Denmark Road in Oxford Township, NJ in 2011. Associated Residential Well Logs (#P1297) were also scanned and Rock Core Segment Photographs taken. (#P1300). Already existing digital infrastructures were updated for 515 geologic mine logs. Metadata associated with all these items was created and uploaded to the NDC. The NJGWS successfully fulfilled all its goals and met all its deadlines under the grant. This report, and the uploading of metadata to the NDC, fulfills the non-financial elements of the fiscal year 2015 NGGDPP grant requirements.

Web Statistics for NJGWS Data Available Online*

Year	2012	2013	2014	2015
Website Hits	43,764	39,898	40,309	37,789
Data Download Hits	77,524	99,123	135,971	144,801
Publication Download Hits	1,724,709	2,467,447	1,921,040	669,728
Total Download Hits	1,802,233	2,566,570	2,057,011	814,529

*Data is current as of February 2016